

REMARKS

Applicants appreciate the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the amendments above and the remarks below.

For purposes of Appeal, no claims have been amended.

No new matter has been added.

Double Patenting

Claims 1-2, 4-7, 9-11, 13-18, and 20 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 20-28 of copending Application No. 12/169,238. The Examiner states that although the conflicting claims are not identical, they are not patentably distinct from each other because both references claim a shielding system for a physical vapor deposition chamber, the chamber having a pedestal movable between a lowered loading and unloading position and a raised deposition processing position and surrounded by chamber interior lower, side and upper walls, the chamber further including a sputter target above the pedestal, the shielding system comprising: a pedestal shield attachable to the pedestal and movable therewith between the lowered and raised positions, the pedestal shield having an outwardly and downwardly extending portion surrounding and extending from the pedestal toward the chamber lower walls and an outwardly and upwardly curving end extending toward the chamber side walls; and a sidewall shield

adapted to extend substantially around and within the chamber sidewalls, and downward from an upper portion thereof, the sidewall shield having a curved inwardly and downwardly extending portion with a lower end extending inward and disposed below a pedestal upper surface plane and adjacent the pedestal shield upper portion when the pedestal is in the raised position, the sidewall shield lower end being above the pedestal when the pedestal is in the lowered position a distance sufficient to permit a wafer to be horizontally loaded onto the pedestal, the pedestal shield and sidewall shield cooperating, when the pedestal is in the raised position, to avoid contact with each other and prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber.

To overcome this nonstatutory obviousness-type double patenting rejection over claims 1 and 20-28 of copending Application No. 12/169,238 applicant encloses herewith a Terminal Disclaimer and Certificate Under 37 CFR 3.73(b). Accordingly, it is submitted that the pending claims are now in a condition for allowance.

No new matter has been added.

Rejection under 35 USC § 103

The Examiner has rejected claims 1-2, 4-7, 9-11, 13-18, and 20 under 35 U.S.C. 103(a) as being unpatentable over Tepman et al., US Patent No. 5,589,224

(hereinafter referred to as "Tepman Ref 1") in view of Chung et al., US Patent No. 6,171,453 (hereinafter referred to as "Chung").

Applicant disagrees.

As recited in independent claims 1, 14 and 20, applicant's invention is directed to a shielding systems and methods of shielding a physical vapor deposition chamber, which include a pedestal shield removably attachable to a pedestal and movable therewith between the lowered and raised positions, whereby the pedestal shield resides below a top surface plane of the pedestal. The pedestal shield may surround and extend outward from the pedestal toward the chamber side or lower walls (claim 1); or it may have an upper portion surrounding the pedestal and a lower portion extending downward therefrom around the pedestal toward the chamber lower wall (claim 14). The shielding systems and methods also include a sidewall shield that extends downward from an upper portion of the chamber sidewalls and having a lower end. The lower end extends inward and is disposed adjacent the pedestal shield upper portion when the pedestal is in the raised position, and residing above the pedestal when the pedestal is in the lowered position a distance sufficient to permit a wafer to be horizontally loaded onto the pedestal. The pedestal shield and sidewall shield cooperate when the pedestal is in the raised position to avoid contact with each other and prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber.

The Examiner continues to cite Tepman Ref 1 stating that this reference discloses a chamber [2], and a lifter apparatus [90] for moving a pedestal [80] between a lower unloading position and a raised deposition position, whereby the pedestal [80] has an extended segment (i.e. pedestal shield) [82] movable between the raised and lowered positions and has a portion that resides below a top plane of said pedestal [80].

Applicant points out that as is presently claimed the pedestal shield itself resides below a top surface of the pedestal plane. It is well settled case law that during examination the "claims ... are to be given their broadest reasonable interpretation consistent with the specification, and ... claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 [70 USPQ2d 1827] (Fed. Cir. 2004). As such, applicant submits that one of ordinary skill in the art would interpret and understand that the entire or all of the pedestal shield of the invention resides below a top surface of the pedestal plane, not just a portion thereof as in Tepman Ref 1. Paragraph [0046] of the specification and Figs. 2-20 all disclose and show that "all portions of the pedestal shield are below the plane of the top surface of pedestal." While paragraph [0046] refers to "substantially all portions" it should be appreciated and understood from the remainder of the description and the drawings that this phrase refers to all portions of the pedestal shield being below the top surface plane of the pedestal.

Referring to Figs. 1 and 3 of Tepman Ref 1, the annular shield ring 20 fits peripherally over the support 16 and includes a downward extending centering flange 22 that fits into opening 17 and an outer flange 23 parallel to flange 22, whereby the shield ring 20 is seated over and contacts the mating flange 15 of the shield member 10. (Figs. 1 and 3; Col. 3, ll. 14-31.) This annular shield ring 20 has a raised, inwardly-extending roof 25 that overlaps and resides over a top surface plane of the support 16 to protect the periphery of the substrate from inwardly traveling species (e.g., along direction 56). (Fig. 1; Col. 3, ll. 8-12 and 19-21.)

Referring to Fig. 5 of Tepman Ref 1, this shield arrangement includes a pedestal 80 alone without a removable pedestal shield, whereby the pedestal 80 itself has "a circumferential groove 82 formed in the substrate receiving portion thereof, into which the flange 62 is selectively received," whereby the groove is preferably U-shaped. (Col. 5, ll. 50-66.) Again, this is not the same as or equivalent to applicant's claimed pedestal shield having all portions thereof residing below a top surface plane of the pedestal. Tepman even discloses that the shielding components of the chamber are the pedestal 80 and shield 60 that is attached to the chamber 2. (Col. 5, ll. 50-53 and col. 6, ll. 64-67.) Since the extended portion of the pedestal 80 of Fig. 5 of Tepman Ref 1 is part of the pedestal itself, this extended portion is not and cannot be a separate distinct pedestal shield that is attachable, preferably removably attachable, to a pedestal as is currently claimed.

Applicant continues to submit that Tepman Ref 1 also does not disclose, contemplate or suggest the claimed curvatures of the pedestal or sidewall shields.

In particular, Tepman discloses with reference to Fig. 1 a cylindrical shield 10 mounted to a support ring 4. In the raised position, this shield 10 does extend inwardly and downwardly with a lower end thereof 13 extending inward and disposed below the support 16 upper surface; however, unlike that of the present invention the lower end of the shield 10 is adjacent the annular shield ring 20 lower portion - -not the pedestal shield upper portion as is claimed. Moreover, the flange 15 at the lower end of the shield 10 extends upwardly to contact a lower or bottom surface of the shield ring 20. (Figs. 1 and 3; Col. 3, ll. 14-31.) That is, pedestal shield 10 and sidewall shield 60 do not cooperate in the raised position to avoid contact with each other and prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber, as is claimed. As for the configuration of Fig. 5 of Tepman, again, there is no attachable shield such that any sidewall shield 60 would be able to prevent line-of-sight deposition transmission therewith.

The Examiner has recognized that Tepman Ref 1 fails to disclose or suggest a pedestal shield that is removably attachable to a pedestal. To overcome this deficiency the Examiner cites Chung for the limitation of a pedestal shield 84 that is attachable to a pedestal 82, therein citing Col. 6, lines 59-64.

Applicant submits that Chung discloses a shielding system in which a pedestal shielding ring 84 cooperates with the lower chamber shield 48 (Figs. 6A and 6B) when the pedestal is in the lowered or release position. (See, Figs. 6A and 6B.) Also, in this lowered or release position the lower end of the sidewall shield

48 is adjacent the lower or underside of the shielding ring 84 - -not the upper side of a pedestal shield as is claimed. While applicant concurs that Chung does teach that its pedestal shielding ring 84 may be mechanically attached to the pedestal 82 using an alignment means 96, once attached thereto, this pedestal shielding ring 84 has a top plane surface that resides above the top plane surface of the pedestal 82. As such, neither Tepman Ref 1 nor Chung alone or in combination disclose or suggest a pedestal shield that resides below a top surface plane of the pedestal and is removably attachable thereto, as is claimed.

Further, Chung describes that in it's raised or process position the pedestal shielding ring 84 does not cooperate with the lower chamber shield 48. It is again submitted that Tepman Ref 1 does not disclose, contemplate or suggest the claimed structure features of applicant's sidewall shield when the pedestal is in the raised versus lowered positions, and Chung does not overcome these deficiencies.

In particular, it is submitted that Chung does not disclose, contemplate or suggest a sidewall shield whereby when the pedestal is raised the sidewall shield (i.e., lower chamber shield 48) has a lower end thereof disposed below the pedestal upper surface plane and adjacent the pedestal shield (i.e., the pedestal shielding ring 84) upper portion, whereby the pedestal shield and sidewall shield cooperate when the pedestal is in the raised position to avoid contact with each other and prevent line-of-sight deposition transmission from the sputter target to the side and lower walls of the deposition chamber. On the contrary, in the raised position shown in Fig. 6B of Chung the lower chamber shield 48 resides below the lower

planes of both the pedestal and pedestal shielding ring 84, and there is no cooperation between the pedestal shield and sidewall shield in the raised position. Furthermore, in the lowered position of Chung the sidewall shield lower end is below the pedestal, which is contrary to the present claims.

While it may appear that applicant is reviewing and attacking the references individually, it is submitted that one must do so in order to determine whether or not all of the features the examiner is purporting to exist within the particular cited reference(s) do in fact exist or are suggested therein. Applicant submits that neither Tepman Ref 1 nor Chung, alone or in combination, disclose, contemplate or suggest a pedestal shield in its entirety (and not just a portion thereof since this is not consistent with the specification or drawings) resides below a top surface plane of the pedestal and is removably attachable thereto, alone or in combination with the claimed curvatures of the pedestal or sidewall shields in both the lowered and raised positions discussed in detail above.

In view of the foregoing, applicant submits that claims 1-2, 4-7, 9-11, 13-18, and 20 would not be obvious over Tepman Ref 1 in view of Chung since positively claimed limitations in the pending claims are not disclosed, contemplated or suggested in Tepman Ref 1 or Chung, alone or in combination. Accordingly, the substitution of a two-piece removable pedestal shield as taught by Chung in place the single-piece pedestal shield and pedestal of Tepman would not render obvious the present invention due to the above deficiencies still remaining in these references.

The Examiner has also rejected claims 21-24 under 35 U.S.C. 103(a) as being unpatentable over Tepman Ref 1 and Chung as applied to claims 1 and 20 above, and further in view of Tepman et al., US Patent No. 5,803,977 (hereinafter referred to as "Tepman Ref 2").

The Examiner states that Chung further teaches that the pedestal shield 84 is removably attached to an end portion of the pedestal 82 via a mechanical connection 92 (col. 6, lines 51-64). The Examiner recognizes that Chung does not suggest that the end portion of the pedestal is a separate isolated ring and cites Tepman Ref 2 for this deficiency. Applicant submits that Tepman Ref 2 does not overcome the deficiencies of Tepman Ref 1 and/or Chung, alone or in combination, since Tepman Ref 2 also discloses an annular shield ring 20 that resides above the top plane surface of the pedestal 504 and has a wall-like cylindrical shield member 10 that directly contacts the underside of the annular shield ring 20. Whether or not Tepman Ref 2 discloses a deposition ring, applicant submits that none of the cited references disclose, contemplate or suggest that all of a pedestal shield resides below a top surface plane of the pedestal and is removably attachable thereto, along with the claimed curvatures of the pedestal or sidewall shields in both the lowered and raised positions discussed in detail above and as currently claimed.

In view of the foregoing, it is submitted that Tepman Ref 1, Tepman Ref 2 nor Chung, alone or in combination, render obvious claims 21-24.

Applicant submits that the examiner has pointed to individual components of applicant's claimed invention rather than taking applicant's claims as a whole. An invention "composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR Int'l Co. v. Teleflex Inc.* 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, (2007). The record must show that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." *Id.* at 1741. Here the record contains no such finding.

It is also submitted that approaches to obviousness determinations which focus merely on identifying and tabulating "missing elements" in hindsight retrospect "imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge," and, "fall victim to the insidious effect of hindsight syndrome where that which only the inventor taught is used against its teacher." *W.L. Gore & Assoc. v. Garlock*, 721 F.2d 1540, 1553 [220 USPQ 303] (Fed. Cir. 1983). "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." *In re Fine*, 837 F.2d at 1075, 5 U.S.P.Q.2d at 1600. For the reasons as discussed above, applicant submits that the record supports a conclusion of nonobviousness. It is submitted that any contrary conclusion would be based on hindsight.

Further, there is nothing in the record to show or indicate that a skilled artisan would have had a "reasonable expectation of success" in deriving the

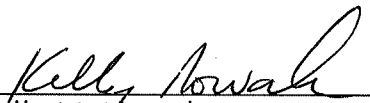
claimed invention in light of the teachings of the prior art. See, *In re Kubin* (Fed. Cir. April 3, 2009), citing, *In re O'Farrell*, 853 F.2d 894, 904 (Fed. Cir. 1988). As such, the claimed invention was not reasonably expected in light of the prior art, and therefore, was not "obvious to try." See *Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1364 (Fed. Cir. 2008). Again, the record supports a finding of non-obviousness.

As for the Examiner's comments in the Response to Arguments section, applicants disagree with the Examiner and submit that a single reference may not be interpreted differently so as to fit the Examiner's rejection. Rather, a reference must be taken as a whole and cited for what is disclosed as a whole therein. In particular, at page 3 of the Office Action dated November 30, 2009 the Examiner states that Tepman discloses that the "pedestal shield 82" is attachable to the pedestal 18, citing col. 6, ll. 16-21, not the pedestal itself as the Examiner now states in the present Office Action. Also, on page 8 of the Office Action dated November 30, 2009 the Examiner stated that Tepman is limited in that the pedestal shield being attachable to the pedestal is not suggested, not that the pedestal shield is removably attachable to the pedestal as stated in the present Office Action. While applicant appreciates that a 102 rejection and a 103 rejection require different standards of review, it is submitted that a single component cannot be cited in a contradictory manner as did the Examiner in the Office Action dated November 30, 2009, which now appears to be remedied by the Examiner's current

statements in the present Office Action whereby the Examiner refers first to the pedestal itself and then to a removably attachable pedestal shield.

It is respectfully submitted that the application has now been brought into a condition where allowance of the entire case is proper. Reconsideration and issuance of a notice of allowance are respectfully solicited.

Respectfully submitted,


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